Minnkota Power
MPC COOPERATIVE, INC.
Your Touchstone Energy® Partner

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August 28, 2001

Jeffery L. Burgess, Director
Division of Air Quality
North Dakota Department of Health
P.O. Box 5520
Bismarck, ND 58506-5520

Dear Mr. Burgess:

This letter is to follow up on Minnkota Power Cooperative's letter dated August 15, 2001. That letter was in response to your letter to Minnkota Power Cooperative, dated July 3, 2001. A review of the information previously provided the Department requires that our initial response be "updated". In order to avoid confusion, we ask that you disregard the previous letter, as all applicable comments will be reiterated herein.

We have reviewed the Department's calculations of the historical emission rates for the Milton R. Young Station Unit 1. Although we have corrections to the numbers utilized, we concur with the methodology used to calculate the Annual SO_2 emissions and the Max. Hourly SO_2 emissions. Additionally, we believe the Max. Hourly SO_2 emissions should be utilized as the maximum 3-hour SO_2 emission rate as well. As you are aware, power plants conduct a Uniform Rating of Generating Equipment, URGE, test at least once each year. This test is four hours in duration. During this test, coal fired steam electric generating units typically operate at up to 105% of their Maximum Continuous Rating, MCR. Generating units normally "ramp up" to 105% MCR the hour preceding the beginning of test period, in order to allow the unit's output to stabilize. Therefore, a unit is at 105% MCR for a total of five hours. The maximum hourly SO_2 emissions would occur over this period. After an URGE test, a unit returns to its normal maximum continuous rating. In the case of Unit I, this is 100% MCR. If the Max Hourly SO_2 emissions are prorated throughout the twenty-four hour period in which an URGE test is conducted, the hourly emission rate for the twenty-four hour period is equal to 0.9623 multiplied by the Max Hourly SO_2 emissions. We believe the resulting emission rate is representative of the maximum twenty-four hour emission rate.

A review of records indicates that coal sulfur analysis data previously submitted to the Department, shows the maximum sulfur content of the coal burned in the year 1976 or 1977 to be 1.3% rather than the 0.78% or 0.84 % shown in the annual emission inventory reports for these years and the data sheet attached to the Department's letter. Utilizing the Department's methodology, the maximum 3-hour SO_2 emission rate for the

Milton R. Young Unit 1 would be either 7787.91 lbs/hr occurring in 1976, or 8130.33 lbs/hr occurring in 1977. The maximum 24-hr SO_2 emission rate would be either 7494.31 lbs/hr occurring in 1976, or 7823.82 lbs./hour occurring in 1977. For purposes of modeling, it would be acceptable to us to average the maximum short term emission rates for 1976 and 1977. Therefore, the maximum 3-hour SO_2 emission rate for Unit 1 would be 7959.12 lbs/hour. The maximum 24-hour SO_2 emission rate would then be 7659.07 lbs/hour. A copy of the previous correspondence to the Department supporting the 1.3% sulfur content of the coal burned in 1976 or 1977 is attached.

A review of the data supplied with the Department's letter and our records, indicates that the annual SO_2 emissions for the year 1976 are anomalous due to unusually low average sulfur concentration in the coal delivered to the plant for that year. Therefore, we request that data from the year 1976 not be utilized in determining the average annual emission rate input for the air dispersion modeling. The most representative emission rate would be reflected by an average of the annual SO_2 emissions from the years 1974,1975, and 1977. Therefore, the model SO_2 inputs for Unit 1 should then be based upon an average of 15,477 tons/yr for the annual scenario.

The Department's letter also indicates that the EPA rules and guidance allow the potential to emit to be utilized for the modeling inputs, if little or no operational data is available. This scenario would apply to Milton R. Young Station Unit 2. We believe the potential to emit should be utilized for the 3-hour, 24-hour, and annual inputs. For Unit 2, the model inputs should then be based upon 5635.2 lbs./hr of SO_2 for the 3-hour and 24-hour scenarios, and 24,682.18 tons/yr of SO_2 for the annual scenario.

In a study that involves a comparison of emissions, the methods by which the emissions are measured must be considered. The hourly and annual emissions reported to the Department, which where emitted prior to the year 1995, were calculated based upon the Compilation of Air Pollutant Emission Factors, AP – 42. Those emissions that were emitted in the year 1995 and later, were measured by CEMS. Shortly after CEMS where installed, it was recognized by the users and later by the EPA, that due to problems with the reference methods for the flow monitors, the CEMS could be indicating emissions much higher than what was actually occurring. The attached comparison of the Unit 1 SO_2 emissions measured by the CEMS versus those calculated by the methods outlined in AP-42 for the year 2000, indicates that the CEMS measured higher rates by 11.8%. In order to accurately compare data for Unit 1 from the year 2000 with data from the years 1974 – 1977, we believe the year 2000 CEMS data should be reduced by 11.8 % for modeling purposes. Thus, all inputs will be determined by the same basis, i.e. calculated and calculated vs. calculated and measured. (New stack flow monitoring systems will be certified in October of 2001 for the Milton R. Young Station's Units 1 & 2. The installation of the new stack flow

monitoring systems and the use of new EPA reference methods should reduce measurement errors considerably.)

Should you have any questions concerning the above, please contact me at 701-795-4221.

Very truly yours,

MINNKOTA POWER COOPERATIVE, INC.

John T. Graves, P.E.
Environmental Manager

C: David Loer
David Sogard
Luther Kvernen

MPC
One of the Minnkota Power Systems
MINNKOTA POWER COOPERATIVE, INC.
MILTON R. YOUNG STATION
P.O. Box 127, Center ND 58530-0127 • Phone: (701) 794-8711
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February 12, 1998

Mr. Tom Bachman
Division of Environmental Engineering
North Dakota Department of Health
P.O. Box 5520
Bismarck, ND 58506-5520

RE: Coal Analysis

Dear Mr. Bachman:

Enclosed is the information that was requested with regard to sulfur analysis and date of combustion. The enclosed information includes a sheet of coal analyses that were completed during the mid-1970s.

The analysis for drill hole DDH 76 shows a sulfur content of 1.3 percent. The attached maps show the location of the drill hole, and that the area was mined in 1976. This coal would have been combusted during 1976 or early in 1977.

If you have any questions, please contact me at 701/794-8711.

Sincerely,

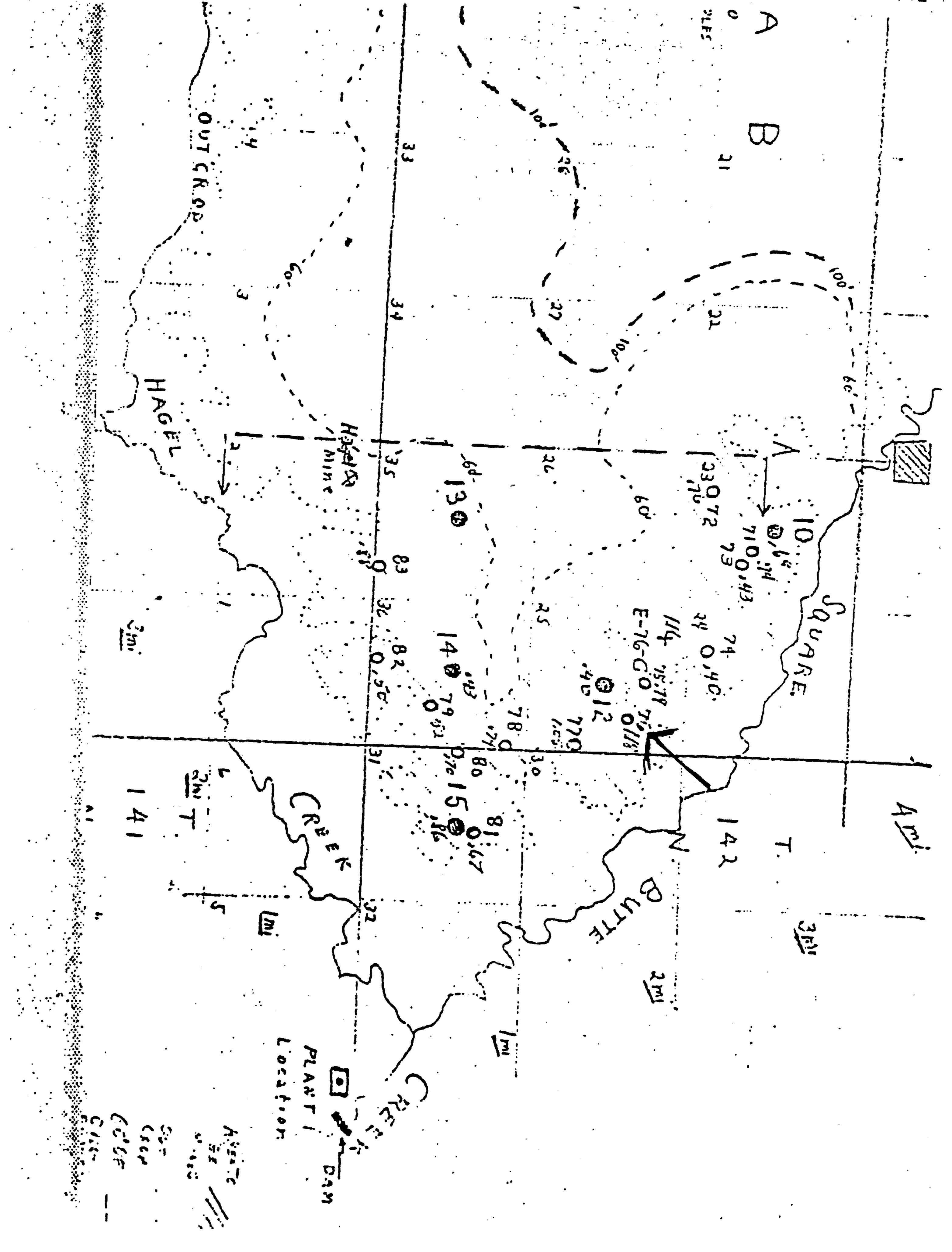
MINNKOTA POWER COOPERATIVE, INC.

K. Thomas

Kevin Thomas
Permitting and Compliance Engineer

skb/stacey/ktcoal

c: File: 101.150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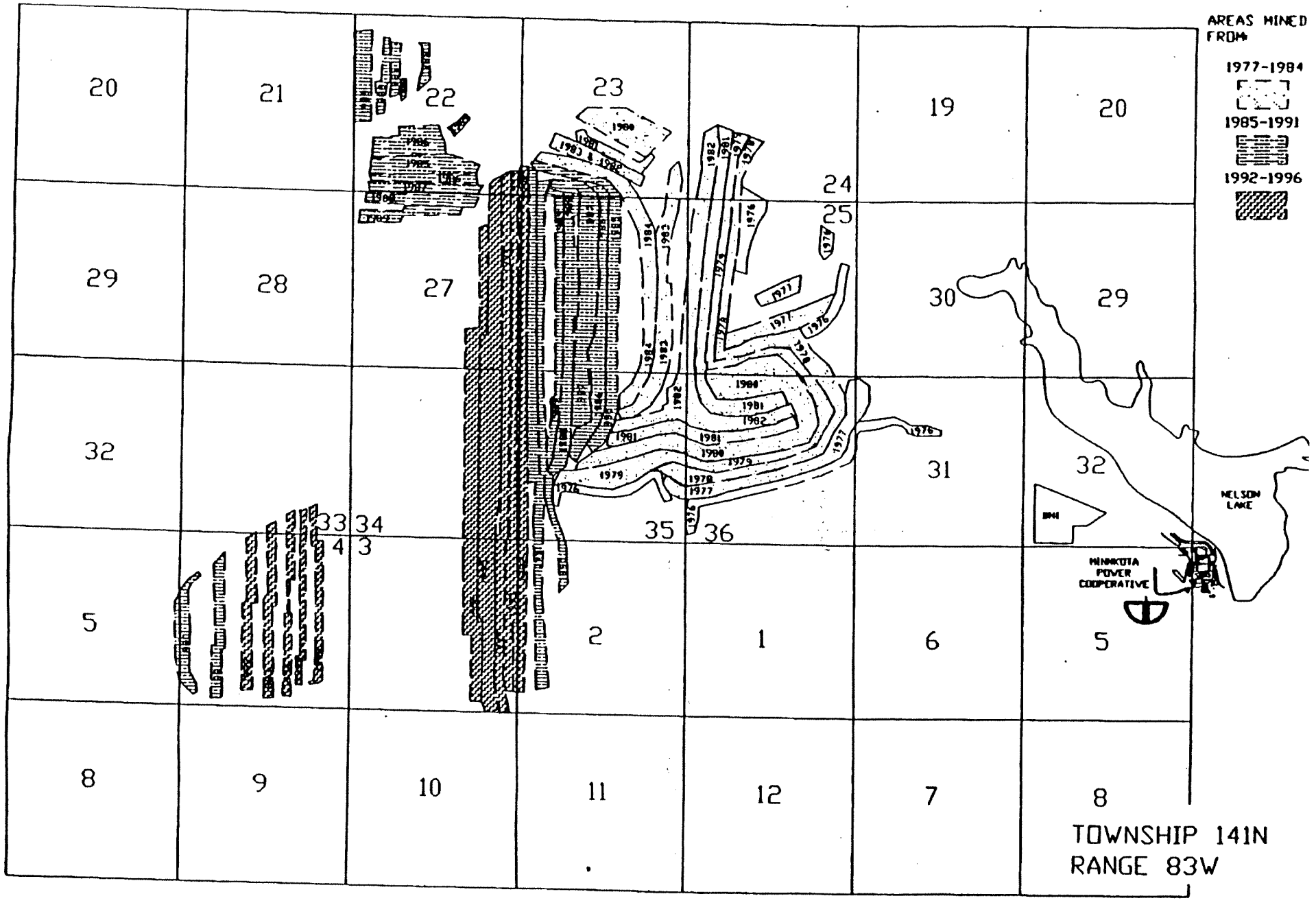

TABLE II. ANALYSES OF LIGNITE CORES, MAIN BED

	DDH 71	DDH 72	DDH 73	DDH 74	DDH 75	DDH 76	DDH 77	DDH 78	DDH 79	DDH 80	DDH 81	DDH 82	DDH 83	Numerical Average
Location														
Township and Range	142N,84W	142N,84W	142N,84W	142N,84W	142N,84W	142N,84W	142N,83W	142N,84W	142N,84W	142N,83W	142N,83W	141N,84W	142N,84W	
Section	23	23	23	24	25	25	30	36	36	31	31	1	35	
Thickness, inches	156	150	109	107	123	134	129	126	136	140	123	135	115	129
Analysis (As Received)														
Moisture	32.77	31.13	32.94	32.69	32.54	31.62	32.58	40.31	27.56	32.04	32.99	33.07	34.35	32.83
Ash	6.08	7.40	3.98	3.86	5.73	7.33	8.28	4.07	7.01	4.93	5.70	5.23	6.01	5.66
Btu	7,433	7,430	7,328	7,591	7,384	7,388	7,151	6,610	7,828	7,398	7,342	7,238	7,094	7,324
Sulfur	0.80	0.84	0.47	0.44	0.86	[redacted]	1.15	0.61	0.96	0.77	0.73	0.53	0.94	0.80
Analysis (Dry Basis)														
Ash	9.05	10.74	5.94	5.73	8.50	10.67	12.28	7.82	9.68	7.25	8.46	7.88	9.15	8.70
Btu	11,056	10,789	10,927	11,277	10,946	10,804	10,607	11,074	10,806	10,886	10,891	10,912	10,806	10,906
Sulfur	1.19	1.22	0.70	0.65	1.28	1.90	1.70	1.02	1.33	1.13	1.08	0.80	1.43	1.19
Fusion Temperature of Ash														
Reducing Atmosphere														
Initial Deformation	2,285	2,180	2,350	2,360	2,310	2,235	2,200	2,345	2,330	2,355	2,365	2,435	2,285	2,310
Soft. (H=W)	2,365	2,215	2,410	2,400	2,385	2,290	2,230	2,400	2,405	2,435	2,430	2,470	2,300	2,368
Soft. (H=1/2W)	2,385	2,235	2,460	2,435	2,445	2,335	2,260	2,435	2,440	2,500	2,435	2,475	2,340	2,400
Fluid	2,395	2,250	2,465	2,470	2,535	2,370	2,280	2,470	2,485	2,535	2,440	2,490	2,370	2,430
Oxidising Atmosphere														
Initial Deformation	2,400	2,210	2,465	2,370	2,425	2,395	2,220	2,415	2,455	2,425	2,405	2,445	2,345	2,383
Soft. (H=W)	2,435	2,240	2,505	2,470	2,460	2,455	2,250	2,460	2,470	2,480	2,440	2,480	2,410	2,427
Soft. (H=1/2W)	2,470	2,275	2,530	2,525	2,495	2,500	2,280	2,495	2,485	2,500	2,470	2,520	2,445	2,461
Fluid	2,500	2,310	2,550	2,585	2,560	2,535	2,305	2,510	2,510	2,566	2,490	2,540	2,480	2,495
Alkalies, as Sodium Oxide, Na_2O	0.53	0.24	0.21	0.07	-	0.23	0.16	0.09	0.16	-	0.06	0.07	0.15	0.18
Hardgrove Grindability	-	39.1	-	-	41.1	-	-	-	-	44.2	-	-	-	-
Equilibrium Moisture	-	35.84	-	-	-	-	-	-	-	-	-	-	-	-
Air Dry Loss	-	3.48	-	-	-	-	-	-	-	-	-	-	-	-
Ash Analysis														
Boron, B	0.21	0.16	0.36	0.29	0.23	0.18	0.15	0.24	0.21	0.28	0.20	0.27	0.23	0.23
Phosphorus pentoxide, P_2O_5	0.11	0.16	0.35	0.04	0.16	0.10	0.07	0.16	0.07	0.08	0.07	0.12	0.19	0.13
Silica, SiO_2	11.75	27.68	14.15	12.16	13.92	14.62	25.34	14.03	17.73	16.19	19.28	18.04	20.27	17.24
Ferric oxide, Fe_2O_3	11.12	10.10	9.25	6.80	13.67	19.22	13.49	10.60	12.16	6.60	10.71	7.60	13.80	11.13
Alumina, Al_2O_3	10.97	12.85	12.64	11.12	8.72	10.00	11.62	11.86	10.07	10.59	11.73	13.26	13.62	11.47
Titania, TiO_2	0.33	0.49	0.38	0.38	0.32	0.30	0.42	0.36	0.35	0.36	0.39	0.41	0.32	0.37
Lime, CaO	24.71	20.92	24.65	32.37	23.24	20.21	18.54	30.69	28.40	34.72	27.65	35.65	19.89	26.66
Magnesia, MgO	6.35	4.17	8.57	9.44	6.20	4.82	5.17	9.58	6.46	8.65	7.18	5.13	6.22	6.76
Sulfur trioxide, SO_3	27.80	20.63	25.46	25.66	27.09	23.08	22.86	21.39	22.78	20.43	21.29	18.61	23.46	23.50
Potassium oxide, K_2O	0.19	1.09	0.28	0.07	0.22	0.36	0.74	0.12	0.32	0.10	0.37	0.22	0.50	0.35
Sodium oxide, Na_2O	5.72	1.54	3.29	1.13	0.55	1.37	0.83	1.11	1.47	1.31	0.44	0.78	1.28	1.64
Undetermined (by diff.)	0.74	0.37	0.62	0.54	0.69	0.20	0.77	0.00	0.02	0.69	0.69	0.18	0.62	0.48